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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/812,420 | 03/30/2004 | Kaori Misawa | 403019/TAKADA | 1268 |

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| EXAMINER | |
|---|---|
| PENG, KUO LIANG | |
| **ART UNIT** | **PAPER NUMBER** |
| 1712 | |

DATE MAILED: 09/30/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/812,420 | MISAWA ET AL. | |
| | Examiner | Art Unit | |
| | Kuo-Liang Peng | 1712 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *3/30/04 Prel. Amendment*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☒ Other: *See Continuation Sheet*.

Continuation of Attachment(s) 6). Other: English translation of JP 2001-098218.

## DETAILED ACTION

1. The Applicants' preliminary amendment filed on March 30, 2004 was received. Claims 1-13 are amended. Now, Claims 1-13 are pending.

Double patenting

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. Claims 1-8 and 13 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over Claims 64-66 and 73-75 of copending Application No. 10/926,321. Although the conflicting claims are not identical, they are not patentably distinct from each other because of the following reason. The copending application is directed to the use of a composition comprising a siloxane resin, a solvent, an onium salt and a

thermal decomposing/volatile compound, which obviously reads on the instant claims of the present invention.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

4. Claim 1 is provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over Claim 21 of copending Application No. 10/932,319. Although the conflicting claims are not identical, they are not patentably distinct from each other because of the following reason. The copending application is directed to a composition comprising a siloxane resin, a solvent, an onium salt and a thermal decomposing/volatile compound, which obviously reads on the instant claims of the present invention.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject

> matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 1-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hayashi (JP 2002-060691) in view of Nobe (JP 2001-098218).

For Claims 1, 6-9, 11 and 13, Hayashi discloses a method of forming a porous film on a semiconductor substrate, which is derived from a composition comprising a polysiloxane, a porogen such as polyalkylene oxide, etc., an onium salt such as an ammonium salt and a solvent. ([0005]-[0007], [0019]-[0021], [0028], [0031], [0034], [0042]) Hayashi teaches the solvent removal at room temperature. ([0042]). However, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to remove the solvent at a slightly elevated temperature. The motivation of solvent removal at a slightly elevated temperature is to facilitate the solvent removal process. Hayashi further teaches the formation of a porous film (i.e., the polymerization of the polysiloxane and the decomposition of the porogen) at an elevated temperature under an inert-gas atmosphere or oxidizing atmosphere. The temperature for this porous film-formation process can range from 80 to 600oC, and the process can contain different heating stages. ([0042]) Hayashi is silent on a separate heat treatment for

vaporizing the porogen. However, Nobe teaches that it is desirable to completely decompose the porogen only after the network formation of the polysiloxane. The motivation is to prevent the shrink of the polymerized polysiloxane so that a low dielectric constant of the material cannot be achieved. ([0031]) Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to include a separate heat treatment for evaporating the porogen. The weight average molecular weight of the polysiloxane is exemplified in Examples.

For Claims 2 and 12, the temperature of the heat treatment for evaporating the solvent depends the solvent used and the rate at which the solvent is evaporized. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to evaporate the solvent at whatever temperature through routine experimentation in order to properly facilitate the solvent removal. Especially, Applicants do not show the criticality of the temperature, and the solvent used in Hayashi can be the one described in [0028], which reads on the solvent used in the present invention. For Claims 3-4, Hayashi is silent on the specific temperature range for polymerizing the polysiloxane. However, the polymerization temperature will affect the dielectric constant of the resulting porous film because as taught above by Nobe that due to improper temperature, all of the porogens being decomposed before the network formation

of the polysiloxane will result in a higher dielectric constant of the film formed. In other words, the polymerization temperature is a Result-Effective variable. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to polymerize the polysiloxane through routine experimentation in order to obtain a film with proper dielectric constant. Especially, Applicants do not show the criticality of the polymerization temperature. See MPEP 2144.05 (II). For Claim 5, Nobe teaches the evaporation of the porogen at a temperature described in [0036]-[0037]. For Claim 10, Hayashi is silent on the molecular weight of the polyalkylene oxide. However, the molecular weight will affect the decomposition temperature of the polyalkylene oxide. In other words, it is an Result-Effective variable. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to utilize a polyalkylene oxide having whatever molecular weight through routine experimentation in order to afford a composition with proper porogen decomposition temperature. Especially, Applicants do not show the criticality of the molecular weight. See MPEP 2144.05 (II). The English translation of JP 2001-098218 has been attached to this Office action, while the translation of 2002-060691 has been requested by Examiner. It will be available later upon Applicants' request.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kuo-Liang Peng whose telephone number is (571) 272-1091. The examiner can normally be reached on Monday-Friday from 8:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski, can be reached on (571) 272-1302. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

klp
September 23, 2005

Kuo-Liang Peng
Primary Examiner
Art Unit 1712